Assessment of modified malted flours enzymatic activity; focus on amylase and phytase effect for the application of flat bread.

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Flat bread is characterised by a magnified staling effect due to a high heating rate during baking (1) and a small crumb to crust ration. In order to give the bread a flat shape, a rapid baking at high temperatures (ca. 300°C for less than 2 min) yields high heating rates ? 80°C/min unlike conventional breads (ca~7°C/min). Malted flour addresses the interest of a natural source of enzymes such as amylase and phytase, which address respectively a reduced staling, and a better availability of minerals in the baked bread. This contribution aims at investigating the performance of a malted flour with focus on the amylase effect applied for flat bread, and the assessme,t of the phytase on different bran fractions. The methodology involved the production of a wheat based malted flour using a conventional germination step (4 days at 18°C). The enzymatic activity was assessed with a Malt-Amylase-kit (Megazyme). Breads were produced at two different heating rates (5 and 40 C °/min) to assess the staling effect from the maltogenic ?-amylase. Breads were baked using a miniaturized heating system based on a Pelletier heater (1). The staling was monitored by measuring the Young modulus of the baked crumb and the retrogradation enthalpy of amylopectin during two weeks storage(10°C). The dough stickiness was assessed using a Kieffer-ring system. Amylopectin retrogradation was assessed with calorimetry and the crumb firmness with dynamic mechanical analyser. Phytase activity was asses on different bran fractions for future application. Results showed a significant impact of the heating rate on the kinetics and magnitude of staling. The amylopectin retrogradation was higher with increasing heating rate, whereas no significant dough stickiness was observed. Phytase had higher activity on malted samples than control bran. As a conclusion, the malted flour addresses several challenges in the case of rapid baking conditions such as those encountered with flat bread production. Alternative process strategies should be investigated to favor the enzymes effectiveness in the case of flat bread production. The present work represents a potential clean alternative process for low heating rate-baked products
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